

**III B.Tech I Semester Supplementary Examinations, May 2005**  
**ANALOG COMMUNICATIONS**  
**(Electronics & Communication Engineering)**

**Time: 3 hours****Max Marks: 70**

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) Give a neat sketch of a telephone relay and explain its working.  
(b) A telephone relay having a resistance of 1500 ohms and an inductance of 3 Henries has an operating current of 20mA and release current of 8 mA. Calculate time lag in operating and in releasing when the relay is working across a 50v supply. Assume the relay short circuited under release conditions.
2. (a) Explain with block diagram, the frequency discrimination method for generating SSB modulated waves.  
(b) Compare various AM techniques.
3. (a) Explain clearly the difference between Amplitude, Frequency, and Phase modulations, beginning with the definition of each type and the meaning of the modulation index in each case.  
(b) Explain with the block diagram the Armstrong method of FM generation.
4. (a) An FM signal  $X_c(t) = A_0 \cos(\omega_0 t + \beta \sin \omega_m t)$  is applied as input to an RC high pass network. Assume that  $\frac{1}{\omega RC} \gg 1$  in the frequency band occupied by  $X_c(t)$ . Show that the output voltage of RC network is an AM signal. Find the modulation index of AM signal.  
(b) What is zero crossing detectors? Explain how it works and can be used as an FM demodulator?
5. (a) Explain the operation of radio transmitter with a block diagram.  
(b) Why the first power amplifier in radio transmitter is called buffer amplifier?  
(c) What is the function of harmonic generator in radio transmitter  
(d) What are the contents of audio frequency channel in radio transmitter
6. (a) Explain two methods of controlling the gain of a radio receiver.  
(b) Explain briefly about the following: Mixer, Choice of IF and Image Frequency.
7. Write short notes on the following:-
  - (a) Receiver measurements
  - (b) Squelch circuits
  - (c) Noise limiter.

8. For a modulating signal  $m(t) = \cos(\omega_o t)$ , show that PM is superior to FM by a factor of 2.25 from the SNR point of view.

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